

1 UNITED STATES DISTRICT COURT
2 SOUTHERN DISTRICT OF NEW YORK

3 _____ X

4 In re: Methyl Tertiary Butyl Ether
5 ("MTBE") Products Liability Litigation

6 _____ X

7 Master File No. 1:00-1898

8 MDL No. 1358 (SAS)

9 M21-88

10 _____ X

11 CONFIDENTIAL (Per 2004 MDL 1358 Order)

12
13 VIDEOTAPED 30(b)(6) DEPOSITION OF
14 DAVID P. BOLIN RE FOCUS PLUMES 6, 8, AND 9
15 November 21, 2008

16
17 Taken at 650 Town Center Drive,
18 20th Floor, Costa Mesa, California, before
19 Harry A. Palter, California Certified
20 Shorthand Reporter No. 7708, Certified
21 LiveNote Reporter.

22
23 GOLKOW TECHNOLOGIES, INC.
24 877.370.3377 ph|917.591.5672 fax
deps@golkow.com

1 A. There's been MTBE detected in
2 every single well drilled for this site,
3 including the on-site wells, the site margin
4 wells, and the offsite wells with the
5 exception of MW-6 in the northeast corner.

6 There is water that appears to
7 be flowing away from the site. The
8 contamination has never been delineated.
9 And -- vertically or laterally.

10 So I think it's not being
11 contained.

12 If it's not being contained,
13 it's certainly not being removed.

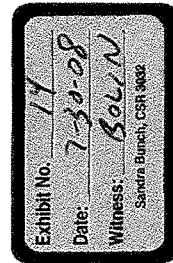
14 Q. And just to clarify -- I want
15 to make sure I understand -- do you have a
16 view as to what direction the MTBE or TBA at
17 this site is traveling?

18 MS. O'REILLY: Incomplete
19 hypothetical.

20 Overbroad.

21 THE WITNESS: We have
22 talked about that several times.

23 In this case, the flow
24 direction, or directions, are



Bellwether Plume Site	Site Name	Address	City	farthest downgradient well	date max MTBE detected in well	date remediation system started	remediation technology
2	Mobil #18-JMY; Arco #3083	3470 Fairview Rd.	Costa Mesa	MW-15	4.9 in 11/01	2/1/1998	DPE/P&T
2	Arco #6131	3201 Harbor Blvd.	Costa Mesa	B-9	41000 in 11/89	11/3/2004	Sparg/SVE
2	Costco FV	17900 Newhope St.	Fountain Valley	no wells	nt	na	none
2	Mobil #18-HDR	3195 Harbor Blvd.	Costa Mesa	MW7	5/23/2001	4/1/1995	P&T
7	Arco 1994	700 State College Blvd.	Anaheim	UNK - closed 7/30/01, Geotrack rps leak 7/30/01, VE test Mar-01, excav			
7	Unocal #5869	676 S. State College Blvd.	Anaheim	UNKNOWN - no data after 4/16/89			
9	Chevron #9-5401	5992 Westminster Blvd.	Westminster	MW-9	880 in 11/03	none	none
9	Huntington Beach Arco	6002 Bolsa	Huntington Beach	MW-8	1900 in 2/02	7/9/2002	DPE
9	Shell #6502	6502 Bolsa Ave.	Huntington Beach	B-21 B-25 B-46	630 in 9/00 6.8 in 9/01 5.8 in 8/06	4/1/1989	P&T
9	Thrifty #368	6311 Westminster Blvd.	Westminster	MW-9	93 in 8/00	5/1/2003	P&T
9	Unocal #5123	14972 Springdale St.	Huntington Beach	MW-15	15 in 5/03	Apr-02	DPE
9	Unocal #5226	6322 Westminster Ave.	Westminster	MW-9	12000 in 7/00	12/18/2004	P&T
9	Westminster Shell	5981 Westminster	Westminster	MW-9	90 in 8/97	1/18/2001	P&T
9	USA #141	14800 Edwards St.	Westminster	MW-7	220 in 8/97	6/9/2000	DPE/interm

OCWD-MTBE-001-186921

Reference Rpt / Doc		4/23/2008 1st Qtr 08 GWM & Rem Prog Rpt	
(1) MTBE detected in production wells in 2005 (wells MCWD-3B, MCWD-5, and MCWD-7).	---	---	---
(4) The MTBE plume migrated down below the screened interval in downgradient well(s). Case closed 2006. MTBE detected in production wells in 2005 (wells MCWD-3B, MCWD-5, and MCWD-7).	---	B-8 slightly farther downgrad. B-9 higher interval in downgradient well(s). Case closed 2006. MTBE: max 120,000 11-26-97, 12000 6-8-00; B-9 max TBA 6190 5-15-03; OCHCA Case Close Sum Rpt. CASE CLOSED Mar-08.	11/2/05
USTs installed in 2006.	---	USTs installed in 2006.	---
(2) There was a significant spike in MTBE detections in the most downgradient monitoring well in 2001 that indicated an additional significant release of MTBE from the site.	---	Not max MTBE, but 2nd spike max on 5/23/01 (6 yrs after starting water rem). Rpt.	4/11/08 1st Qtr 08 GWM & Rem Prog
(4) Leak reported 2001. The MTBE plume migrated down below the screened interval in downgradient well(s).	---	Case closed 7/30/01; leak reported (Geotrack) 7/30/01 VE rem Mar-01.	---
(4) The MTBE plume migrated down below the screened interval in downgradient well(s).	---	case closed 7/15/99; rem Apr-00; no data / info after 4/16/99.	---
(1) MTBE detected (LIMS) in 2005 (HB-13) and 2006 (HB-7).	---	NO record of GW capture OR remediation to date.	12/14/08 4th Qtr 06 GWM Rpt - shallow zone.
(1) MTBE detected (LIMS) in 2005 (HB-13) and 2006 (HB-7).	---	MW-8 at downgrad edge of site (S); Upper zone MW-12 farther downgrad, maybe too shallow; MTBE in zone "C", but deeper zone untested at MW-12	1/31/08 4th Qtr 07 GWM & Stat Rpt
(1) MTBE detected (LIMS) in 2005 (HB-13) and 2006 (HB-7).	---	GW flow NW, W, & SW; max TBA; well B-21 = 1,200 ug/L in 8/01 & 3/08.	5/9/08 1st Qtr 08 GWM & Stat Rpt.
(1) MTBE detected (LIMS) in 2005 (HB-13) and 2006 (HB-7).	---	GW flow S; max TBA in MW-9 100 ug/L 8/20/01.	4/21/08 1st Qtr 08 Status Rpt.
(1) MTBE detected (LIMS) in 2005 (HB-13) and 2006 (HB-7).	---	GW flows S to SW in zones A, B, & C; downgrad well MW-16 (ND MTBE & TBA) covered by asphalt bef 11/1/02; optimum location???	11/4/08 4th Qtr 08 GWM Rpt.
(1) MTBE detected (LIMS) in 2005 (HB-13) and 2006 (HB-7).	---	On-site GW remed began after max MTBE detected in furthest off-site well - not captured.	4/23/08 1st Qtr 08 GWM Rpt.
(1) MTBE detected (LIMS) in 2005 (HB-13) and 2006 (HB-7).	---	No effort to capture or mitigate GW contam until 8 years after leak detection.	11/2/07 3rd Qtr 07 GWM Rpt.
(1) MTBE detected (LIMS) in 2005 (HB-13) and 2006 (HB-7).	---	Off-site wells not loc downgrad of gw flow direction.	11/30/07 4th Qtr 07 GWM Rpt.

OCWD-MTBE-001-186922

ORANGE COUNTY WATER DISTRICT SAMPLE INFORMATION AND RESULTS

Station Name: HB-13/1
Station Type: WELL CASING
Perf Interval (ft bgs): 280-810
Aquifer: UNDEFINED

Well Owner: HUNTINGTON BEACH
Well Name: Well No. 13
City: HUNTINGTON BEACH

Sample Group ID: 5000869
Sample ID: 5002250
Sample Date/Time: 01/18/2005 09:50:00
Receive Date/Time: 01/18/2005 11:50:00
Sampling Method: DEDICATED PUMP
Sampling Agency: O.C. WATER DISTRICT
Sampled By: BRIAN OKEY
Monitoring Program: Title 22

Lab Sample No.: 05010404-02
Laboratory: OCWD
Analysis Requested: 524

FIELD PARAMETERS:
EC (umhos/cm): 934
pH (UNITS): 7.4
TEMP (C): 19.3
D.O. (mg/L): NA
D.O. TEMP (C): NA
Total Chlorine (mg/L): NA
Free Chlorine (mg/L): NA

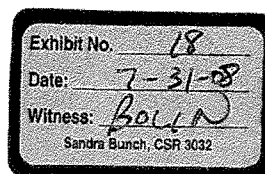
Comments:

Parameter		Analysis Method	Dates		Results		Detect Limits	
Abbr	Name		Extract	Analysis	Value	Units	Value	Units
Reported Values								
TOTALX	Total Xylenes (m,p,&o)	524.2		01/28/2005	ND	ug/L	.5	ug/L
CH3Cl	Chloromethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
CH3Br	Bromomethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
VNYLCL	Vinyl chloride	524.2		01/28/2005	ND	ug/L	.5	ug/L
CIETHA	Chloroethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
CH2Cl2	Methylene Chloride	524.2		01/28/2005	ND	ug/L	.5	ug/L
11DCE	1,1-Dichloroethene	524.2		01/28/2005	ND	ug/L	.5	ug/L
11DCA	1,1-Dichloroethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
CHCl3	Chloroform	524.2		01/28/2005	ND	ug/L	.5	ug/L
CCl4	Carbon tetrachloride	524.2		01/28/2005	ND	ug/L	.5	ug/L
12DCP	1,2-Dichloropropane	524.2		01/28/2005	ND	ug/L	.5	ug/L
TCE	Trichloroethene	524.2		01/28/2005	ND	ug/L	.5	ug/L
112TCA	1,1,2-Trichloroethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
CHBr2C	Dibromochloromethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
PCE	Tetrachloroethene	524.2		01/28/2005	ND	ug/L	.5	ug/L
CLBENZ	Chlorobenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
12DCB	1,2-Dichlorobenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
13DCB	1,3-Dichlorobenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
14DCB	1,4-Dichlorobenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
CCl3F	Trichlorofluoromethane (Freon 11)	524.2		01/28/2005	ND	ug/L	.5	ug/L
112DCE	trans-1,2 Dichloroethene	524.2		01/28/2005	ND	ug/L	.5	ug/L
12DCA	1,2-Dichloroethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
111TCA	1,1,1-Trichloroethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
CHBrCl	Bromodichloromethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
113DCP	trans-1,3-Dichloropropene	524.2		01/28/2005	ND	ug/L	.5	ug/L
c13DCP	cis-1,3-Dichloropropene	524.2		01/28/2005	ND	ug/L	.5	ug/L
BENZ	Benzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
CHBr3	Bromoform	524.2		01/28/2005	ND	ug/L	.5	ug/L
1122PC	1,1,2,2-Tetrachloroethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
TOLU	Toluene	524.2		01/28/2005	ND	ug/L	.5	ug/L
EtBENZ	Ethylbenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
Cl3F3E	Trichlorotrifluoroethane (Freon 113)	524.2		01/28/2005	1.4	ug/L	.5	ug/L
MEK	Methyl Ethyl Ketone (MEK)	524.2		01/28/2005	ND	ug/L	.5	ug/L

NA : Not Analyzed
ND : Not Detected
TR : Trace

02/11/2005 07:34

OCWD WRMS RPT#: 3048 Page: 1



CityofHB 007432

ORANGE COUNTY WATER DISTRICT SAMPLE INFORMATION AND RESULTS

Station Name: HB-13/1
Station Type: WELL CASING
Perf Interval (ft bgs): 280-310
Aquifer: UNDEFINED

Well Owner: HUNTINGTON BEACH
Well Name: Well No. 13
City: HUNTINGTON BEACH

Sample Group ID: 5000869
Sample ID: 5002250
Sample Date/Time: 01/18/2005 09:50:00
Receive Date/Time: 01/18/2005 11:50:00
Sampling Method: DEDICATED PUMP
Sampling Agency: O.C. WATER DISTRICT
Sampled By: BRIAN OKEY
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Laboratory: OCWD
Analysis Requested: 524

FIELD PARAMETERS:
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pH (UNITS): 7.4
TEMP (C): 19.3
D.O. (mg/L): NA
D.O. TEMP (C): NA
Total Chlorine (mg/L): NA
Free Chlorine (mg/L): NA

Comments:

Parameter		Analysis Method	Dates		Results		Detect Limits	
Abbr	Name		Extract	Analysis	Value	Units	Value	Units
Reported Values								
MIBK	Methyl Isobutyl Ketone (MIBK)	524.2		01/28/2005	ND	ug/L	5	ug/L
B2CLEE	bis (2-chloroethyl) ether	524.2		01/28/2005	ND	ug/L	5	ug/L
CCl2F2	Dichlorodifluoromethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
22DCP	2,2-Dichloropropane	524.2		01/28/2005	ND	ug/L	.5	ug/L
c12DCE	cis-1,2-Dichloroethene	524.2		01/28/2005	ND	ug/L	.5	ug/L
CH2BrC	Bromochloromethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
11DCP	1,1-Dichloropropene	524.2		01/28/2005	ND	ug/L	.5	ug/L
CH2Br2	Dibromomethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
13DCP	1,3-Dichloropropane	524.2		01/28/2005	ND	ug/L	.5	ug/L
EDB	1,2-Dibromoethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
1112PC	1,1,1,2-Tetrachloroethane	524.2		01/28/2005	ND	ug/L	.5	ug/L
o-XYL	o-Xylene	524.2		01/28/2005	ND	ug/L	.5	ug/L
STYR	Styrene	524.2		01/28/2005	ND	ug/L	.5	ug/L
ISPBENZ	Isopropylbenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
123TCP	1,2,3-Trichloropropane	524.2		01/28/2005	ND	ug/L	.5	ug/L
PRPBENZ	Propylbenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
BRBENZ	Bromobenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
135TMB	1,3,5-Trimethylbenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
2CLTOL	2-Chlorotoluene	524.2		01/28/2005	ND	ug/L	.5	ug/L
4CLTOL	4-Chlorotoluene	524.2		01/28/2005	ND	ug/L	.5	ug/L
tBBENZ	tert-Butylbenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
124TMB	1,2,4-Trimethylbenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
sBBENZ	sec-Butylbenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
4IPTOL	4-Isopropyltoluene	524.2		01/28/2005	ND	ug/L	.5	ug/L
nBBENZ	n-Butylbenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
DBCP	1,2-Dibromo-3-chloropropane	524.2		01/28/2005	ND	ug/L	.5	ug/L
124TCB	1,2,4-Trichlorobenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
HCIBut	Hexachlorobutadiene	524.2		01/28/2005	ND	ug/L	.5	ug/L
NAP	Naphthalene	524.2		01/28/2005	ND	ug/L	.5	ug/L
123TCB	1,2,3-Trichlorobenzene	524.2		01/28/2005	ND	ug/L	.5	ug/L
mp-XYL	m,p-Xylene	524.2		01/28/2005	ND	ug/L	.5	ug/L
NBENZ	Nitrobenzene	524.2		01/28/2005	ND	ug/L	10	ug/L
x13DCP	Total 1,3-Dichloropropene	524.2		01/28/2005	ND	ug/L	.5	ug/L

NA : Not Analyzed

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TR : Trace

02/11/2005 07:34

OCWD WRMS RPT#: 3048 Page: 2

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Sampled By: BRIAN OKEY
Monitoring Program: Title 22

Lab Sample No.: 05010404-02
Laboratory: OCWD
Analysis Requested: 524

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pH (UNITS): 7.4
TEMP (C): 19.3
D.O. (mg/L): NA
D.O. TEMP (C): NA
Total Chlorine (mg/L): NA
Free Chlorine (mg/L): NA

Comments:

Parameter		Analysis Method	Dates		Results		Detect Limits	
Abbr	Name		Extract	Analysis	Value	Units	Value	Units
Reported Values								
TTHMs	Total THMs	524.2		01/28/2005	ND	ug/L	.5	ug/L
MTBE	Methyl tert-butyl ether	524.2		01/28/2005	ND	ug/L	.2	ug/L
ETBE	Ethyl tert-butyl ether	524.2		01/28/2005	ND	ug/L	1	ug/L
TAME	Tert-amyl methyl ether	524.2		01/28/2005	ND	ug/L	1	ug/L
DIPE	Diisopropyl ether	524.2		01/28/2005	ND	ug/L	1	ug/L
TBA	tert-butyl alcohol	524.2		01/28/2005	ND	ug/L	2	ug/L

NA : Not Analyzed
ND : Not Detected
TR : Trace

02/11/2005 07:34 OCWD WRMS RPT#: 3048 Page: 3

CityofHB 007434

Lab#	SampleID	Collect Date	TestID	ReportedResults	NumericResults	Units
08050206-02	HB-13/1	5/7/2008	MTBE	ND	0.01	ug/L
08020713-02	HB-13/1	2/27/2008	MTBE	ND	0	ug/L
07110180-02	HB-13/1	11/13/2007	MTBE	ND	0	ug/L
07080277-02	HB-13/1	8/14/2007	MTBE	ND	0.01	ug/L
07050012-02	HB-13/1	5/1/2007	MTBE	ND	0.01	ug/L
07020464-02	HB-13/1	2/28/2007	MTBE	ND	0.01	ug/L
06110116-02	HB-13/1	11/8/2006	MTBE	ND	0.01	ug/L
06040493-02	HB-13/1	4/18/2006	MTBE	ND	0	ug/L
06020249-02	HB-13/1	2/13/2006	MTBE	ND	0	ug/L
05110016-02	HB-13/1	11/1/2005	MTBE	ND	0	ug/L
05100413-02	HB-13/1	10/19/2005	MTBE	ND	0.01	ug/L
05090740-02	HB-13/1	9/28/2005	MTBE	ND	0.01	ug/L
05080252-02	HB-13/1	8/9/2005	MTBE	ND	0.01	ug/L
05050156-02	HB-13/1	5/4/2005	MTBE	ND	0	ug/L
05020138-02	HB-13/1	2/8/2005	MTBE	ND	0	ug/L
05010404-02	HB-13/1	1/18/2005	MTBE	ND	0.17	ug/L
04110329-02	HB-13/1	11/10/2004	MTBE	ND	0	ug/L
04110044-02	HB-13/1	11/1/2004	MTBE	ND	0.02	ug/L
04100337-02	HB-13/1	10/12/2004	MTBE	ND	0	ug/L
04100336-02	HB-13/1	10/12/2004	MTBE	ND	0	ug/L
04090690-02	HB-13/1	9/27/2004	MTBE	ND	0	ug/L
04090689-02	HB-13/1	9/27/2004	MTBE	ND	0	ug/L
04080053-02	HB-13/1	8/2/2004	MTBE	ND	0.01	ug/L
04060046-02	HB-13/1	6/1/2004	MTBE	ND	0	ug/L
04050754-02	HB-13/1	5/26/2004	MTBE	ND	0	ug/L
04050753-02	HB-13/1	5/26/2004	MTBE	ND	0	ug/L
04050053-02	HB-13/1	5/3/2004	MTBE	ND	0	ug/L
04020059-02	HB-13/1	2/3/2004	MTBE	ND	0.01	ug/L
03120138-02	HB-13/1	12/2/2003	MTBE	ND	0	ug/L
03100474-02	HB-13/1	10/14/2003	MTBE	ND	0.09	ug/L
03090799-02	HB-13/1	9/23/2003	MTBE	ND	0	ug/L
03070396-02	HB-13/1	7/14/2003	MTBE	ND	0	ug/L
03060043-02	HB-13/1	6/2/2003	MTBE	ND	0	ug/L
03050510-02	HB-13/1	5/19/2003	MTBE	ND	0	ug/L
03050106-02	HB-13/1	5/5/2003	MTBE	ND	0	ug/L
03040734-02	HB-13/1	4/22/2003	MTBE	ND	0	ug/L
03040725-02	HB-13/1	4/22/2003	MTBE	ND	0	ug/L
03030609-02	HB-13/1	3/20/2003	MTBE	ND	0	ug/L
03030607-02	HB-13/1	3/20/2003	MTBE	ND	0	ug/L
03020269-02	HB-13/1	2/10/2003	MTBE	ND	0.04	ug/L
02100717-02	HB-13/1	10/29/2002	MTBE	ND	0.01	ug/L
02090048-02	HB-13/1	9/3/2002	MTBE	ND	0	ug/L
02070054-02	HB-13/1	7/1/2002	MTBE	ND	0	ug/L
02060677-02	HB-13/1	6/20/2002	MTBE	ND	0	ug/L
02060676-02	HB-13/1	6/20/2002	MTBE	ND	0	ug/L
02060060-02	HB-13/1	6/3/2002	MTBE	ND	0	ug/L
02050824-02	HB-13/1	5/28/2002	MTBE	ND	0	ug/L
02020201-02	HB-13/1	2/6/2002	MTBE	ND	0.01	ug/L
02020200-02	HB-13/1	2/6/2002	MTBE	ND	0.02	ug/L
02010266-02	HB-13/1	1/14/2002	MTBE	ND	0	ug/L

Exhibit No.	49
Date:	8/21/08
Witness:	BOCIN
Sandra Bunch, CSR 3032	

OCWD-MTBE-001-188460

Analysis Date

5/16/2008
3/5/2008
11/19/2007
8/17/2007
5/2/2007
3/5/2007
11/10/2006
4/20/2006
2/16/2006
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9/25/2003
7/18/2003
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6/21/2002
6/21/2002
6/6/2002
6/1/2002
2/12/2002
2/12/2002
1/16/2002

OCWD-MTBE-001-188461

Unocal Sta #5356

1913 West Edinger Ave, Santa Ana

RP

A fuel leak was detected at the site in Oct-1992 when seven exploratory borings will drilled near the UST area and dispenser islands. A leaking product line was discovered (Secor, 4/3/08, Response to Comments from Review of Draft Off-Site Groundwater Assessment and Soil Vapor Investigation Report and Human Health Risk Assessment). Subsequent contaminant spikes in UST area (e.g. MW-9 - TBA 36,000 ug/L 12/1/04) - indicates subsequent releases to groundwater. Subsequently, free product observed in Nov-2003 (TRC, 3/12/04, Free Product Sampling and Systems Tank, Line, and Leak Detector Test Report).

RP missed multiple work plan and reporting deadlines, and did not include requested data and information in work plans and reports.

MTBE 1st tested in gw: 1/10/96 in MW-5 (screened 10-25 ft bgs, destroyed 10/10/96; replace w/ TPW-6 - 0-12.5 ft bgs).
MTBE 1st detected in groundwater: 1/10/96 in MW-6 - 4,900 ug/L.
Max MTBE detected in a gw monitoring well: 4/24/97 in MW-9 - 1,900,000 ug/L.

TBA 1st tested in groundwater: 7/6/00 in MW-4 & MW-5 (ND<5000 ug/L).
TBA 1st detected in groundwater: 7/6/00 in MW-4 - 4,100 ug/L (7/1/00 MW-9 - 640,000 ug/L).
Max TBA detected in a gw monitoring well: 6/6/01 in MW-9 - 1,100,000 ug/L.

2 saturated zones are identified (Komex):
semi-perched gw zone: from ~25 to 48 ft bgs (all mont wells screened from 20 to 30 ft bgs).
Alpha Aquifer - ~67 to 105 ft bgs.

Farthest downgradient well MW-25 - 1st tested MTBE and TBA in Mar-03:
Max MTBE not detected (DL - 50 ug/L).
Max TBA detected Oct-04 at 35 ug/L.

BUT MW-25 is not in optimum position / screened interval (see TRC - Fig 2, June 6-4-08 GW Elev map).
MTBE and TBA 1st detected 7/19/02 off-site MW-22 - MTBE 840 ug/L, TBA 210 ug/L - not in line w/ MW-25
MTBE and TBA detected in almost all off-site wells in or after 2002.

Semi-perched groundwater flow direction is SE (Komex report).
Deeper groundwater flow direction is SW (Komex report).
Vertical groundwater gradient is down (Komex report).

Remediation: initiated Apr-2004; **NO groundwater capture initiated.**
Oct-92 - fuel leak discovered.

Feb-95 begin remediation testing - 2.5 yrs after leak discovery:

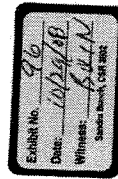
Feb-95 - SVE & pump test - ECE concluded SVE ineffective.
Dec-97 to Feb-01 - periodic purging from selected wells - 21,757 gal removed (ave ~560 gal/mo, concent unk).
Jan-98 - Feas Study & RAP states DPE most effective (DPE doesn't contain gw contain plume - see later data).
Dec-01 - 5-day DPE test ~3yrs after deciding DPE is most effective rem tech.

Jun-01 - after stop purging - max MTBE 87,000 ug/L MW-9; max TBA 1,100,000 ug/L MW-9.

Aug-02 - 2-day AS test ~4.5 yrs after deciding DPE is most effective rem tech.
Nov-02 - a CAP proposing ozone injection as remediation technology submitted to RWQCCB - approved Dec-02.
Apr-04 - C-spargers rem syst initiated - **12 yrs after fuel leak discovered; 9 yrs after beginning rem eval.**
1.5 yrs after approval.

Aug-05 - GEW-1 well installed to ~30 ft bgs - aquifer test: K = 1.7 to 5.2 fdy/ (i=0.15 & ne=0.2 per Secor).
GEW-2 & GEW-3 wells installed Sep-06, 1 yr after 1st gw extract well - geology varied based on bgs.

MTBE and TBA groundwater plumes have migrated off site in ALL DIRECTIONS, but especially SE (7/19/08 TRC - Quarterly Monitoring Report April Through June 2008, 76 Station #5356, 1913 West Edinger Ave, Santa Ana, California).



Historic MTBE and TBA gw plumes have not been delineated laterally.
Recent MTBE and TBA gw plumes have not been delineated laterally.
MTBE and TBA gw plumes have not been delineated vertically.

Groundwater contamination has migrated SE off-site, >300 ft from source point. Groundwater conduits are near by (potential migration paths from shallow saturated zones to deeper saturated zones).

Nearest well: W-17123 - domestic well ~365 ft SE of site - in downgradient direction.
Drilled to 150 ft bgs.

Screened _ unknown _ ft bgs.
pump rate - inactive, abandoned

Nearest well in Principal Aquifer: EDGW-SA - domestic well ~945 ft SE of site - in downgradient direction.

Drilled to 308 ft bgs.

Screened _ unknown _ ft bgs. *Principal aquifer*

pump rate - inactive.

Nearest drinking water production well: DIAM-SA - ~1000 ft SW of site.

Drilled to 179 ft bgs.

Screened unknown

Pump rate = unknown

Top of Shallow zone - ~71 ft bgs.

Bottom of Shallow zone - ~244 ft bgs.

Top of Principal Aquifer - ~284 ft bgs.

Nearest MTBE detection in drinking water production well:
NONE yet

Unocal Sta #5356
19113 West Edinger Ave, Santa Ana, California
Wells - Summary Profiles

Well	Top of Casing Interval (elev-msl)	Screen of Screen	Top of Screen	Bottom of Screen	Bottom of Well	Installed	Status	TPHg			1st Test			1st Detection			MTBE			1st Test			1st Detection			TBA	Max Detected	Max Deflection
								1st Tested	1st Detected	Max Detected	1st Tested	1st Detected	Max Detected	1st Tested	1st Detected	Max Detected	1st Tested	1st Detected	Max Detected	1st Tested	1st Detected	Max Detected						
MW-1	15	15	10	26	26		active	3/31/1993	3/31/1993	1,300	6/6/2001	20,000	1/10/1996	1/10/1996	110	3/14/2001	31,000	7/6/2000	3/14/2001	6,500	8/7/2002	340,000						
MW-2	15	10	10	26	26		aband 10/96	3/31/1993	3/31/1993	68,000	7/6/1996	330,000	1/10/1996	1/10/1996	4,600	7/6/1996	320,000	7/6/2000	3/14/2001	6,500	8/7/2002	340,000	na	na	na	na		
MW-3	15	10	10	25	25		active	3/31/1993	9/21/1993	200	9/7/2005	200	1/10/1996	1/10/1996	63	16/2000	84	7/6/2000	3/22/2003	130	6/6/2005	23,000						
MW-4	15	10	10	25	25		active	3/31/1993	12/21/1993	100	9/20/2001	26,000	1/10/1996	1/10/1996	27	6/6/2001	33,000	7/6/2000	6/6/2001	19,000*	8/7/2002	67,000						
MW-5	15	10	10	25	25		active	3/31/1993	3/31/1993	2,700	10/9/2000	7,100	1/10/1996	1/10/1996	180	7/6/2000	11,000	7/6/2000	3/14/2001	25,000*	5/11/2002	59,000						
MW-6	15	10	10	25	25		aband 10/96	3/31/1993	3/31/1993	21,000	12/21/1993	850,000	1/10/1996	1/10/1996	4,900	7/6/1996	29,000	7/6/2000	3/14/2001	25,000*	5/11/2002	59,000						
MW-7	15	10	10	25	25		dest 1996	3/31/1993	3/31/1993	1,000	6/21/1994	2,100	1/10/1996	1/10/1996	na	na	29,000	7/6/2000	3/14/2001	25,000*	5/11/2002	59,000						
MW-8	15	10	10	26	26		active	6/21/1994	1/10/1996	820	7/14/1998	1,100	1/10/1996	1/10/1996	800	7/14/1998	1,100	10/10/2000	6/2/2003	50*	12/7/2005	9,000						
MW-9	13	7	20	20	20		active	1/16/1997	1/16/1997	840,000	4/24/1997	1,900,000	1/16/1997	1/16/1997	780,000	4/24/1997	1,900,000	7/11/2000	7/11/2000	640,000	6/6/2001	1,100,000						
MW-10	15	5	20	20	20		active	7/8/1997	10/27/1997	210	7/29/1999	3,900	7/8/1997	7/8/1997	33	7/29/1999	6,300	7/6/2000	7/6/2000	240	5/10/2002	13,000						
MW-11	15	5	20	20	20		active	7/8/1997	6/2/2003	280	11/4/2003	66	7/8/1997	10/9/2000	4	5/10/2002	13	7/6/2000	9/2/2003	5.0 J	5/31/2006	660						
MW-12	26	26	5	30	30		active	4/6/2000	11/4/2003	370	11/4/2003	370	4/6/2000	10/9/2000	ND-5	ND-5	ND-5	7/6/2000	11/4/2003	240	11/4/2003	240						
MW-13	?	?	?	?	?		?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?						
MW-14	25	5	30	30	30		active	4/6/2000	4/6/2000	160	10/9/2000	4,200	4/6/2000	4/6/2000	97	10/9/2000	4,000	7/6/2000	10/9/2000	4,400	6/6/2005	8,200						
MW-15	25	5	30	30	30		active	4/6/2000	4/6/2000	900	4/6/2000	900	4/6/2000	4/6/2000	1,700	7/6/2000	1,800	7/6/2000	7/6/2000	1,400	6/2/2003	45,000						
MW-16	25	5	30	30	30		active	4/6/2000	10/9/2000	84	3/22/2003	270,000	4/6/2000	4/6/2000	9	11/6/2001	1,400	7/6/2000	6/6/2001	150	11/6/2001	1,300						
MW-17	25	5	30	30	30		active	3/14/2001	3/14/2001	5,900	3/14/2001	5,900	3/14/2001	3/14/2001	7,800	3/14/2001	7,800	3/14/2001	3/14/2001	8,600	11/4/2002	19,000						
MW-18	25	5	30	30	30		active	3/14/2001	ND-50	ND-50	-	ND-50	ND-50	ND-50	7.0	11/6/2001	7.0	3/14/2001	12/12/2004	49*	5/31/2006	220						
MW-19	20	5	26	26	26		active	2/5/2002	2/5/2002	69	1/21/2004	220	2/5/2002	2/5/2002	91	1/21/2004	210	2/5/2002	2/5/2002	210	1/21/2004	52,000						
MW-20	20	5	25	25	25		active	2/5/2002	2/5/2002	16,000	5/11/2002	30,000	2/5/2002	2/5/2002	41,000	2/5/2002	41,000	2/5/2002	2/5/2002	210	1/21/2004	54,000						
MW-21	20	4	24	24	24		active	7/19/2002	6/2/2003	320	6/2/2003	320	7/19/2002	11/14/2002	1.4	11/14/2002	1.4	7/19/2002	10/6/2004	69	10/6/2004	59						
MW-22	20	4	24	24	24		active	7/19/2002	7/19/2002	610	3/22/2003	200,000	7/19/2002	7/19/2002	840	7/19/2002	840	7/19/2002	7/19/2002	270	7/7/2004	20,000						
MW-23	20	4	24	24	24		active	7/19/2002	3/22/2003	86	3/22/2003	86	7/19/2002	3/22/2003	78	3/22/2003	78	7/19/2002	10/6/2004	270	1/6/2006	1,400						
MW-24	20	5	26	26	26		active	3/22/2003	-	ND-50	-	ND-50	3/22/2003	-	ND-0.5	-	ND-0.5	3/22/2003	10/6/2004	45	10/6/2004	45						
MW-25	20	5	25	25	25		active	3/22/2003	6/2/2003	ND-50	-	ND-50	3/22/2003	-	ND-0.5	-	ND-0.5	3/22/2003	10/6/2004	35	10/6/2004	35						
MW-26	20	5	25	25	25		active	3/22/2003	6/2/2003	270	6/2/2003	270	3/22/2003	3/22/2003	ND-0.5	-	ND-0.5	3/22/2003	10/6/2004	ND-50	ND-50							
MW-27	20	8	28	28	28		active	10/17/2007	-	ND-50	-	ND-50	10/17/2007	-	ND-0.5	-	ND-0.5	10/17/2007	6/4/2008	54	6/4/2008	54						
MW-28	20	2	22	22	22		active	10/17/2007	-	ND-50	-	ND-50	10/17/2007	-	ND-0.5	-	ND-0.5	10/17/2007	6/4/2008	ND-10	ND-10							

	on site
	on site + fringe
	off site

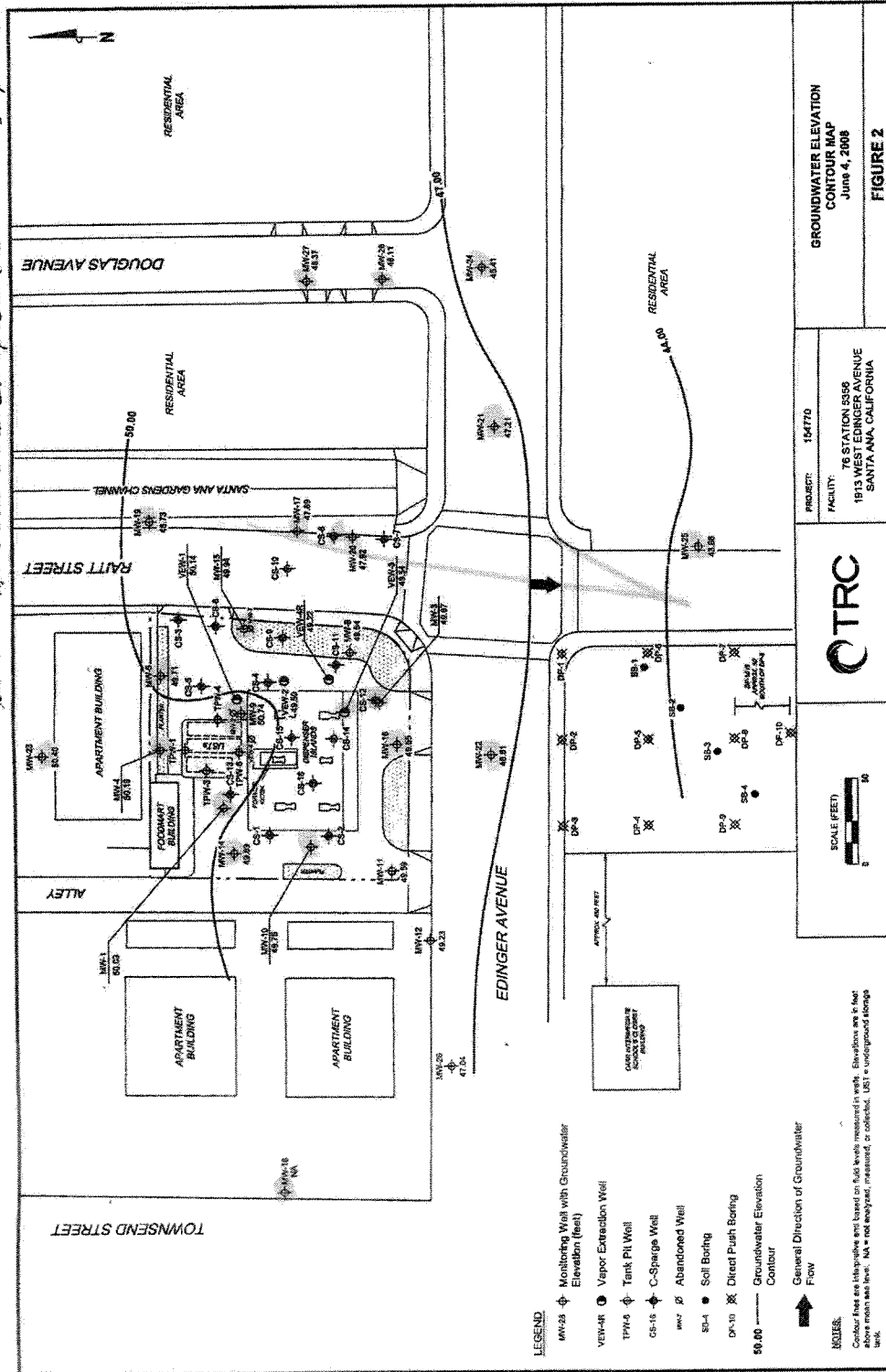
Age group	Number of subjects	Number of subjects with positive results	Number of subjects with positive results (95% CI)
ND-50	1	1	1 (0-2)
51-100	1	1	1 (0-2)
101-150	1	1	1 (0-2)
151-200	1	1	1 (0-2)
201-250	1	1	1 (0-2)
251-300	1	1	1 (0-2)
301-350	1	1	1 (0-2)
351-400	1	1	1 (0-2)
401-450	1	1	1 (0-2)
451-500	1	1	1 (0-2)
501-550	1	1	1 (0-2)
551-600	1	1	1 (0-2)
601-650	1	1	1 (0-2)
651-700	1	1	1 (0-2)
701-750	1	1	1 (0-2)
751-800	1	1	1 (0-2)
801-850	1	1	1 (0-2)
851-900	1	1	1 (0-2)
901-950	1	1	1 (0-2)
951-1000	1	1	1 (0-2)
1001-1050	1	1	1 (0-2)
1051-1100	1	1	1 (0-2)
1101-1150	1	1	1 (0-2)
1151-1200	1	1	1 (0-2)
1201-1250	1	1	1 (0-2)
1251-1300	1	1	1 (0-2)
1301-1350	1	1	1 (0-2)
1351-1400	1	1	1 (0-2)
1401-1450	1	1	1 (0-2)
1451-1500	1	1	1 (0-2)
1501-1550	1	1	1 (0-2)
1551-1600	1	1	1 (0-2)
1601-1650	1	1	1 (0-2)
1651-1700	1	1	1 (0-2)
1701-1750	1	1	1 (0-2)
1751-1800	1	1	1 (0-2)
1801-1850	1	1	1 (0-2)
1851-1900	1	1	1 (0-2)
1901-1950	1	1	1 (0-2)
1951-2000	1	1	1 (0-2)
2001-2050	1	1	1 (0-2)
2051-2100	1	1	1 (0-2)
2101-2150	1	1	1 (0-2)
2151-2200	1	1	1 (0-2)
2201-2250	1	1	1 (0-2)
2251-2300	1	1	1 (0-2)
2301-2350	1	1	1 (0-2)
2351-2400	1	1	1 (0-2)
2401-2450	1	1	1 (0-2)
2451-2500	1	1	1 (0-2)
2501-2550	1	1	1 (0-2)
2551-2600	1	1	1 (0-2)
2601-2650	1	1	1 (0-2)
2651-2700	1	1	1 (0-2)
2701-2750	1	1	1 (0-2)
2751-2800	1	1	1 (0-2)
2801-2850	1	1	1 (0-2)
2851-2900	1	1	1 (0-2)
2901-2950	1	1	1 (0-2)
2951-3000	1	1	1 (0-2)
3001-3050	1	1	1 (0-2)
3051-3100	1	1	1 (0-2)
3101-3150	1	1	1 (0-2)
3151-3200	1	1	1 (0-2)
3201-3250	1	1	1 (0-2)
3251-3300	1	1	1 (0-2)
3301-3350	1	1	1 (0-2)
3351-3400	1	1	1 (0-2)
3401-3450	1	1	1 (0-2)
3451-3500	1	1	1 (0-2)
3501-3550	1	1	1 (0-2)
3551-3600	1	1	1 (0-2)
3601-3650	1	1	1 (0-2)
3651-3700	1	1	1 (0-2)
3701-3750	1	1	1 (0-2)
3751-3800	1	1	1 (0-2)
3801-3850	1	1	1 (0-2)
3851-3900	1	1	1 (0-2)
3901-3950	1	1	1 (0-2)
3951-4000	1	1	1 (0-2)
4001-4050	1	1	1 (0-2)
4051-4100	1	1	1 (0-2)
4101-4150	1	1	1 (0-2)
4151-4200	1	1	1 (0-2)
4201-4250	1	1	1 (0-2)
4251-4300	1	1	1 (0-2)
4301-4350	1	1	

italics - listed test result is inconsistent with other test results from this well.

VIEW-3 has been produced in Nov-03)

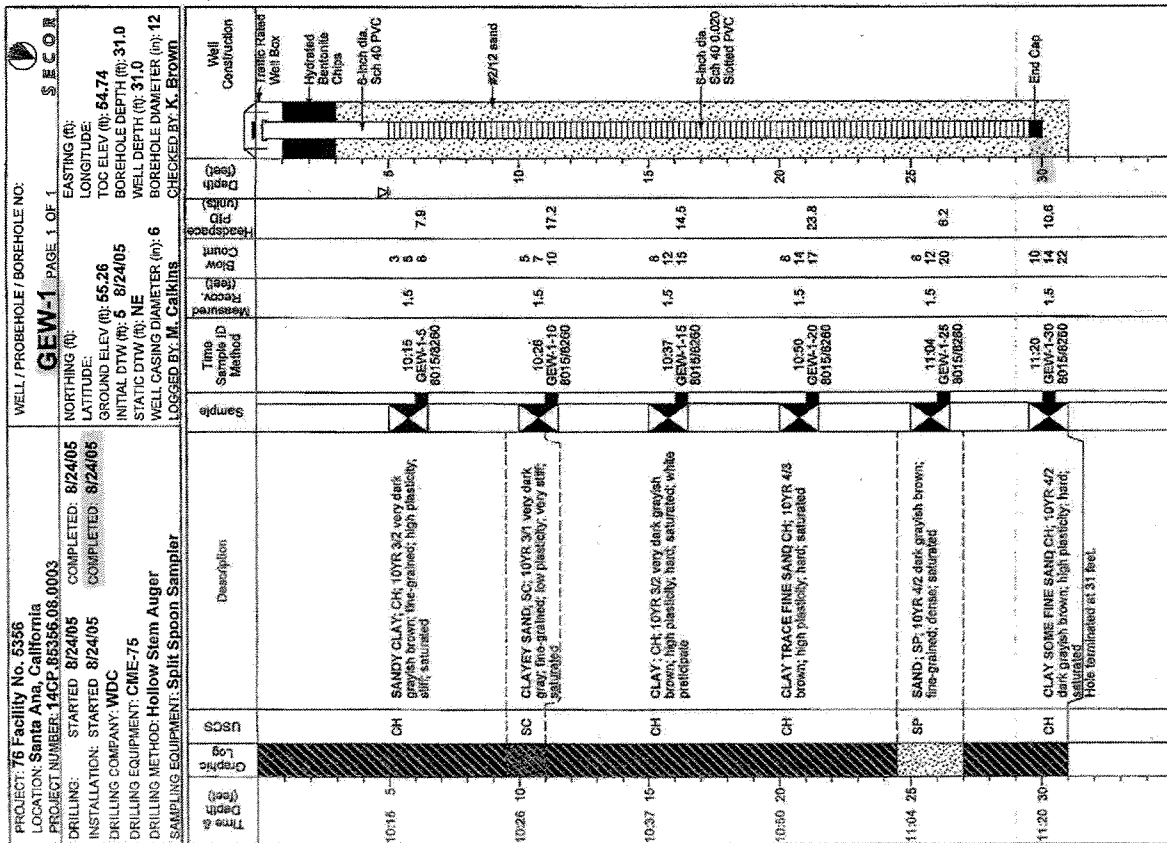
MW-6 secured 10-25-04 to 6/05
TPW-6 secured 0-12-05 to 6/05
TPW-6 or Santa Ana River

Location 3: MW-6 located near center of site (near USFS - 6163); MW-6 destroyed 03T-96)
9 mo after MW-6
1st destroyed
C 4/9/00 y/n



1-0-015' Sec 11/12/02, P. 2
K-1.7-5-2 4/4/04 Sec 11/12/04, P. 11

at ~330 ft south of MW-3;
proposed MW-28 for a
2002 (Sec 11/12/02) Not Test. - see Tab 4;
did not investigate (Station 7/12/04; P. 6)




PROJECT: 76 STATION NO. 5356		WELL / PROBEHOLE / BOREHOLE NO. GEN-1		PAGE 1 OF 1		SECOR				
LOCATION: SANTA ANA, CA		NORTHING (N):		EASTING (E):						
PROJECT NUMBER:		LATITUDE:		LONGITUDE:						
DRILLING: STARTED 8/1/05		GROUND ELEV (ft):		TOC ELEV (ft):						
INSTALLATION: STARTED		INITIAL DTW (ft):		BOREHOLE DEPTH (ft):						
DRILLING COMPANY: WDC		STATIC DTW (ft):		WELL DEPTH (ft):						
DRILLING EQUIPMENT: CME-75		WELL CASING DIAMETER (in):		BOREHOLE DIAMETER (in):						
DRILLING METHOD: HOLLOW STEEL AUGER		LOGGED BY: M. CALKINS		CHECKED BY:						
SAMPLING EQUIPMENT: SPLIT SPOON										
Time & Depth (feet)	USCS	Description	Sample	Time Sample ID	Measured (feet)	Recovery (feet)	Blow Count	Head Pressure (psi)	Depth (feet)	Borehole Backfill
5	CH	8 INCH CLAY W. DK. GR. BN (10YR 3/5), SATURATED, FINE SAND, H. PLASTICITY		10:15	16.3	5.9			5	
10	SA	CLAYEY SAND		10:26	11.5	17.2	5		10	
15	SE	SANDY CLAY, W. DK. GR. (10YR 3/1), SATURATED, FINE SAND, L. PLAST.		10:37	1.5	14.5	8		15	
20	EA	CLAY, SA 5-5 SAMPLE WHITE PRECIPITATE		10:50			12		20	
25		BROWN (10YR 4/3)					15		25	
30		TRACE FINE SAND					8		30	
35	SP	SAND, DK GR. BN (10YR 4/6), SATURATED, FINE SAND		11:04			14		35	
	CH	CLAY, DK GR. BN (10YR 4/6), SAT. H. PLAST., SOME FINE SAND		11:20			17			
							8			
							12			
							20			
							10			
							14			
							22			

MMS

PROJECT: COP 76 Station #5356		WELL / PROBEHOLE / BOREHOLE NO.		SECOR					
LOCATION: 1913 West Edinger Avenue, Santa Ana, California		PROJECT NUMBER: 14CP 02488.05.1222		GEW-2 PAGE 1 OF 1					
DRILLING: STARTED 9/26/06 COMPLETED: 9/26/06		NORTHING (N):		EASTING (E):					
INSTALLATION: STARTED 9/26/06 COMPLETED: 9/26/06		LATITUDE:		LONGITUDE:					
DRILLING COMPANY: WDC Exploration & Wells		GROUND ELEV (ft):		TOC ELEV (ft):					
DRILLING EQUIPMENT: CME 75		INITIAL DTW (ft): 23		BOREHOLE DEPTH (ft): 36.0					
DRILLING METHOD: Hollow Stem Auger		STATIC DTW (ft): NE		WELL DEPTH (ft): 36.0					
SAMPLING EQUIPMENT: Split Spoon Cal Mod		WELL CASING DIAMETER (in): 6		BOREHOLE DIAMETER (in): 10					
		LOGGED BY: C. Lewis		CHECKED BY:					
Time & Depth (feet)	USCS Log	Description	Sample	Time Sample ID Method	Measured Depth (feet)	Row Count	Headspace (inches)	Depth (feet)	Well Construction
0-5	Graphic Log	Atchall (savin)							Well Construction Wharton Well Box Concrete 5" Sch 40 PVC Hydrated Bentonite Chip Seal
10	CL	CLAY; CL; brown; moist	9:10 GEW-2-10 #015M82608		2.9			10	
15		CLAY; brown; moist; 20-30% silty, white mottling.	9:15 GEW-2-15 #015M82608		3.1			15	
20		CLAY; moist	9:20 GEW-2-20 #015M82608		1.9			20	
25	SW	SAND; SW; grayish brown; fine to medium-grained; saturated; well graded	9:30 GEW-2-25 #015M82608		2.6			25	
30		Same as above.	9:40 GEW-2-30 #015M82608					30	
35	CL	CLAY; CL; brown; saturated Hole terminated at 36 feet.	9:45 GEW-2-35 #015M82608					35	Threaded End Cap

SD FORM 304 GEW-2-35W-01 SECOR INTL. 07/11/08

PROJECT: COP 76 Station #5356 LOCATION: 1913 West Edinger Avenue, Santa Ana, California PROJECT NUMBER: 14CP-02488-05.1222				WELL / PROBEHOLE / BOREHOLE NO.: GEW-3 PAGE 1 OF 1				 SECOR	
Time & Depth (feet)	USCS	Description	Sample	Time Sample ID Method	Headed Recv. (feet)	Blow Count (blows/ft)	Headed Recv. (feet)	Depth (feet)	Well Construction
0-5		Gravelly sand						5	Wellhead
10	ML	CLAYEY SILT; ML; 7.5 YR 4/4 brown, moist; 20-30% clay, trace coarse sand, mottled.	8.27 GEW-3-10 8015M/82608	7	78.9	11		10	Well Box Concrete Seal 1/2" Sch 40 PVC Hydrated Bentonite Chip Seal
15		Same as above, wet.	8.40 GEW-3-15 8015M/82608	5	3.6	7		15	3 Monterey Sand Pack
20	SW	SAND; SW; 7.5 YR 4/4 brown, fine to coarse, medium to saturated, trace very coarse sand and cobbles.	8.45 GEW-3-20 8015M/82608	5	5.0	8		20	0.020-inch sanded Sch 40 PVC
25		Same as above.	9.15 GEW-3-25 8015M/82608	5	8.2	7		25	
30	ML	CLAYEY SILT; ML, saturated	9.25 GEW-3-30 8015M/82608	7	18.2	9		30	6" Sch 40 PVC
35	CL	CLAY; CL; fine to medium-grained, trace coarse sand.	9.35 GEW-3-35 8015M/82608	6	8.2	8		35	Threaded End Cap
	CL	CLAY; CL; brown, saturated Hole terminated at 35 feet.							

DEO FORM 304 (REV 2-4) GEW-3 & GEW-4 SECOR INTL (07/11/95)

